

REMARKS

In view of the amendments presented above and the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 USC § 102 or obvious under the provisions of 35 USC § 103. Thus, the Applicants believe that all of these claims are now in allowable form.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, the Examiner should telephone Mr. Peter L. Michaelson, Esq. at (732) 530-6671 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Specification

Applicants have changed the title per the Examiner's suggestion. The title is now as follows:
"METHODS AND APPARATUS FOR MONITORING, COLLECTING, STORING, PROCESSING AND USING NETWORK TRAFFIC DATA OF OVERLAPPING TIME PERIODS".

Formal Errors

Applicants have amended claim 11 to remedy a minor grammatical and formal errors. Claim 1 has been amended to insert the word "the" after "records in" in line 4 to provide a proper antecedent basis.

Rejections under 35 USC § 102

The Examiner has rejected each of independent claims 1, 12 and 17, and the depending claims 13 and 14 as being anticipated under the provisions of 35 USC § 102 over the teachings in the Abe patent (United States Patent 5,966,509 issued October 12, 1999, to Hiroaki Abe et al). In response, Applicants have amended independent claim 1 to include the limitations of claim 2. Applicants have also amended independent claims 12 and 17 to include the limitations of claims 15 and 16; and 16 and 18, respectively. Therefore the rejection under 35 USC § 102 is now moot.

Rejections under 35 USC § 103

A. Amended Independent claims 1, 12 and 17

The Examiner has rejected each of dependent claims 2-11, 15, 16 and 18-29 as being obvious under the provisions of 35 USC § 103 over the teachings in the Abe et al patent (United States Patent 5,966,509 issued October 12, 1999 to Hiroaki Abe). This rejection is respectfully traversed. Since independent claim 1 has been amended to include the limitations of claim 2, amended independent claim 1 will be discussed with respect to the rejection under 35 USC § 103.

In essence, the Examiner recognizes that the Abe et al patent does not disclose the method of transferring data to and removing data from the storage device. The Examiner then takes Official Notice that "FIFO (first-in, first-out) methods of storing and replacing data, buffering systems for data and multiple processors are old and well known in the art. FIFO systems are widely utilized to free space on a storage disc. By removing the oldest data, it is possible to free storage space for the newest data to occupy. A buffer, like a cache, is a midpoint holding place for data but exists not so much to accelerate the speed of an activity as to support the coordination of separate activities. Multiple processors provide added efficiency for the transfer of data between points." The Examiner then asserts that it "would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the data transfer system of Abe with a FIFO system, buffer and multiple processors as claimed. The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the data storage device of Abe with a FIFO system in order to free storage space on the storage for the newest data by removing the oldest data, a buffer in order to coordinate data transfer activities and multiple processors in order to increase the speed and efficiency of the data transfer process." While this assertion appears facially plausible, when viewed in the context of the specific teachings in the Abe et al patent, this assertion does not stand up to close scrutiny.

Generally speaking, the Abe et al patent is directed to the same subject matter as the present

Applicants; namely, network management. However, as the Examiner will soon see, the teachings of the Abe et al patent and those of the present invention sharply diverge.

In the Abe et al patent, a network management device for managing a plurality of network elements has a network element management data acquisition unit for acquiring, in stages, various management data possessed by the network elements when a session with a network element is resumed and when the network management device itself is started up. A rule management table stores a dependence relationship between an operation and management data necessary to execute the operation. When an operation has been specified, a feasible operation decision processing unit refers to the dependence relationship to determine whether management data necessary to execute the operation has been acquired. If the necessary management data has been acquired, a network management execution unit executes network management conforming to the operation." (See Abe et al patent, Abstract).

In particular, in Fig. 41, the Abe et al patent illustrates various traffic data tables provided in a storage unit. The traffic data tables store data at different resolutions, such as fifteen minute, hourly, daily, monthly and yearly traffic data. A rounding unit processes the fifteen minute data into hourly data. (col. 21, lines 13 et seq.).

The Abe et al patent teaches an approach that gathers network traffic data in different resolutions for a

designated time and time period. By designating the time period over which traffic data is collected, it is unnecessary to acquire traffic data constantly and it suffices to acquire and store traffic data solely with regard to a time period over which traffic management is to be actually performed. This makes it possible to reduce the necessary storage capacity of the storage unit and to shorten the time needed for acquisition of the traffic data. (col. 20, lines 14 et seq.)

The traffic data is stored in a three-dimensional matrix structure in which managed objects are arrayed along the x axis, management categories along the y axis and acquisition time along the z axis. In another embodiment of the Abe et al patent, by designating the object that is to undergo traffic management, the Abe et al patent reduces the necessary storage capacity of the storage unit. (col. 15, lines 11 et seq.).

As the Examiner can surely appreciate, the Abe et al patent manages storage capacity by specifying parameters, such as the time and time period for data collection, or the object that is to undergo traffic management. However, it may be desirable to monitor all the traffic over a large network over a long period of time. If the approach of specifying parameters, such as that taught in the Abe et al patent, is to monitor the traffic of a large network, the three-dimensional matrix would consume a large amount of storage space on a storage device, unless the specified time period is sufficiently short.

The Applicants take a markedly different approach. The present invention does not rely on specifications to limit the amount of collected data, but can collect data for all the traffic. To limit the amount of required storage space, the Applicants use FIFO data structures. When a FIFO data structure becomes full, the oldest data is replaced. Therefore data collection continues while discarding the oldest data.

The Abe et al patent does not teach or suggest using a FIFO data structure in the data collection process, or using a FIFO data structure at each level of data resolution such that at least a portion of the data stored in the FIFOs overlaps. That FIFO methods of storing and replacing data may be well-known in the art does not render Applicants' invention obvious. The Applicants used a FIFO data structure in a novel way to limit the amount of data collected for network management. A separate FIFO data structure is used to store the data at each different resolution. The Abe et al patent has no such teaching. The FIFO data structures store data for overlapping periods of time. The Abe et al patent has no such teaching. When a FIFO data structure becomes full, the oldest data is overwritten. The Abe et al patent has no such teaching. In one embodiment, the storage space is allocated equally among the FIFO data structures. The FIFO data structures are allocated, the FIFO data structure associated with the time period having the highest resolution will become full first, and its data will be overwritten. The Abe et al patent has no such teaching.

Furthermore the FIFO data structure of the present invention is complementary to the method taught in the Abe et al patent, and therefore different from the Abe et al patent. A managed object could be specified for data collection and that data continuously stored in the FIFO. Eventually, a FIFO data structure will become full and data will be replaced.

Thus, the present invention is not shown, disclosed or suggested, whether explicitly or even implicitly, by the cited art, whether taken singly or in combination, including that put forth by the Examiner.

Independent claim 1, as amended, contains suitable limitations directed at the distinguishing aspects of the present invention. This claim, with these limitations shown in a bolded typeface, recites as follows:

"A method of processing and storing data in a computer system including processor circuitry, and a data storage device, the method comprising the steps of:

storing first and second sets of records in separate first-in, first-out data structures, respectively, on the data storage device, the first and second sets of records being of different data resolutions and corresponding to overlapping periods of time;

operating the processor circuitry to receive data

collected over a period of time;
and

**operating the processor
circuitry to update at least one
record in each of the stored first
and second sets of records with
the received data such that a
previous record included in each
of the first and second data
structures is replaced."** [emphasis
added].

Each of remaining independent claims 12 and 17
contains very similar distinguishing limitations to those
recited in claim 1.

As such, the Applicants submit that none of their
independent claims are rendered obvious by the teachings in
the cited art. Hence, each of these independent claims is
patentable under the provisions of 35 USC § 103.

Moreover, each of claims 3-11, 13-14 and 19-29
depends, either directly or indirectly, from independent
claims 1, 12 and 17, respectively, and recites further
distinguishing aspects of the present invention. As such,
each of these dependent claims is also not rendered obvious
over the teachings in the cited art for the same exact
reasons set forth above. Hence, each of these dependent
claims is also patentable under the provisions
of 35 USC § 103.

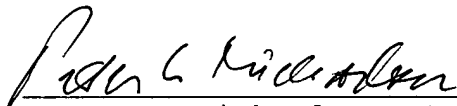
Conclusion

Thus, the Applicants submit that none of the claims, presently in the application, is obvious under the provisions of 35 USC § 103.

Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

Respectfully submitted,

October 11, 2000

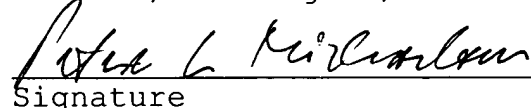


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